

Occupational Medicine and Public Health

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THERE is need for some clarification of the role of occupational medicine as a field of preventive medicine in relation to the health of the public as well as to that of the working population. The following paragraphs may apply to some extent to the practice of occupational medicine in industrial nations generally, but since the patterns of medical practice in the United States differ in certain respects from those elsewhere, it seems wise to adhere fairly closely to the local scene in this discussion. Furthermore, I have deliberately differentiated occupational medicine from general medical practice in an occupational setting in order to emphasize the physician's task in the management of occupational hazards. For I am concerned here, among other matters, with professional relationships which, once established, are more satisfactorily modified gradually from within than disrupted from without.

The Present Situation

Despite the developments of recent years that have tended to define the scope and functions of occupational medicine and to establish it as a specialized field of medical practice, there is little evidence of a concerted attitude or a unified basis for action within the profession generally. Under these circumstances, the description of the job of the physician in industry is more likely to be supplied by industrial management than by the profession, and it is not strange,

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therefore, that this job often turns out to be indistinguishable, in substance and in spirit, from that of any other technical or administrative employee in the business organization. The job fits into the organization wherever it pleases the management to place it, to the credit or discredit of the physician or physicians concerned and of the profession as a whole. It is early—too early, no doubt—in the life of this youthful segment of organized medicine for it to achieve general recognition within the industrial community. But it is high time that the profession itself should gain some awareness of its mission within industry. “The fault” in this situation as in many another “is in ourselves.” For there is still an opinion, strongly and widely held within the profession, that any really good physician is competent to engage in such practice without any special training or even experience. Also prevalent in certain circles in preventive medicine, especially among those trained or experienced in public health practice, is the impression that their training or experience has constituted an adequate preparation for the practice of occupational medicine. Even more common is the belief that a few weeks of indoctrination or a short period of tutelage in certain special techniques will suffice to convert any physician into a reasonably capable practitioner of occupational medicine.

There is just enough validity in these views to give them a certain plausibility and to contribute to the confusion of those who otherwise might seek to obtain sound preparation for careers in occupational medicine. Under the present conditions in American industry, the principal but not the sole site of the practice of occupational medicine, almost any physician who enters the field can make significant con-

tributions to the health of the workmen for whom he assumes some responsibility. He may not see what most needs to be done, and he is unlikely without training to direct his efforts effectively, but if he is sincere, alert, and willing to work, he will find need for his services and opportunities to give them. For, on the one hand, occupational medicine calls for good clinical medicine, for well-substantiated diagnosis in the case of individual workmen, and even for therapy in certain instances. On the other hand, it concerns itself with the appraisal of the health of groups in the population, bringing into play appropriate applications and adaptations of the disciplines of epidemiology and biometry which have been developed so successfully in public health. But still more than familiarity with these disciplines is required of the industrial physician if he is to meet the needs of the times, for he must combine with the skills of the clinician and the epidemiologist the special knowledge of the toxicologist, the insight needed to explore the often obscure hazards and stresses of modern industrial environment, and the capacity to seek out and activate the technical and managerial abilities available in the industrial organizations in the interest of good industrial hygiene. To these qualities must be joined social wisdom, born of compassion and human understanding, sharpened by familiarity with the social and behavioral sciences, and based on a good grounding in the historical development and present organic structure of modern industry.

These are the requirements that have set a satisfactory pattern for the performance of the physician in occupational medicine and have dictated that the specific points for its application shall be at the sites of men's occupations. These requirements have created the demand for a new and special type of professional training. Such training can, of course, be acquired on the long and hard road of experience and such has been the lot of most of those now engaged in this field of practice. But it can now be obtained in a better ordered and more expeditious educational regimen, more closely attuned to the urgent needs of an industrial society. Put in simple terms, the demand is for physicians who understand or can learn

by intensive study to understand the impacts of the environment of our technological and highly organized industrial society on people, individually and collectively, and who will employ their professional talents strategically, at the appropriate sites, in the control of such impacts within physiological limits.

With but few exceptions, the most hazardous occupational sites, as well as those which involve the largest numbers of the working population, are situated within organized industries. Moreover, industrial employees can be studied and supervised more efficiently and effectively than can those who work in the widely scattered occupations of the farm and the household. The greatest present unsatisfied need for medical skill is found in industry, and it seems certain that nowhere else can American physicians contribute so much to the health of this Nation at this time. If this should appear to be a rash statement, consider certain simple and readily verifiable facts.

1. The industrial population of the United States numbers more than 60 million persons.

2. Technological developments in American industry have resulted in the exposure of industrial employees to countless numbers and types of inadequately explored chemical and physical hazards.

3. The incidence of the known varieties of occupational disease within our industrial population is unknown, and the unrecognized, non-disabling impairments of health that must certainly occur within this vast population have yet to be explored.

4. The large proportion of physicians employed in industry in some part-time or full-time capacity are untrained or poorly trained in occupational medicine and are so utilized as to be relatively ineffectual.

5. The total number of physicians fully employed in the tens of thousands of busy industrial plants in this huge country is somewhat less than 5,000 and is probably nearer to 3,000.

It is only fair to recognize that the lack of physicians in industry is counteracted in some degree by the services of industrial nurses, but these too are in short supply. American industry has an almost unique and highly beneficial feature; increasingly the physical and chemical hazards of industry are being sub-

jected to control through the efforts of technical personnel in the field of industrial hygiene. The technical designers and operators of industrial processes have also learned much and have applied their knowledge in the development and use of equipment and procedures which contribute to the diminution of occupational hazards, while basic improvements in machinery and the advent of automation have introduced safety factors into the day's work. Without these nonmedical contributions to industrial hygiene, the default of medical science and education in the modern industrial community would be glaringly obvious.

The fact remains, nevertheless, that the threats visited upon our working population and upon our industrial society generally by the technological revolution are serious, are increasing in number and type, and are unfathomed and currently unfathomable by the available medical and hygienic resources that are brought to bear upon them. This is not to indulge in harsh criticism, or to suggest that physicians, medical investigators, and medical educators have been idle or irresponsible. On the contrary, the achievements of our contemporary medical leaders and colleagues have been notable. But it must be recorded and granted that their attention has been directed toward the further understanding of the older and more familiar as well as the more baffling forms of human disease and toward their therapy, rather than toward the recognition, elucidation, and control of the new threats which have been multiplied around us in our places of work and elsewhere by the inventive genius of our intensely curious, industrious, and venturesome technologists.

Remedial Action

The problem I have outlined would seem to demand prompt action for its early solution, and insofar as such a solution can be afforded by physicians, a much greater concentration of professional personnel and effort within industry would seem to be required. This is not to indicate that there is not a corresponding need for greater attention on the part of all agencies in preventive medicine and public health—Federal, State, and local health depart-

ments—to problems of industrial health and to community problems derived from industry. These agencies can and should investigate and disclose the existence of occupational hazards, take appropriate action under the laws to focus more and more attention upon such hazards, and aid in their elimination. They should maintain services of information and consultation for the benefit of industry and the public. Until much better and more general medical services are available in industry, the vital statistics in relation to occupational disease for most of American industry will be incomplete and highly unsatisfactory, even misleading. But the publication of such statistics as are available will continue to serve a useful purpose which will be the greater if their shortcomings are recognized and counteracted by investigation and by advice to industry.

The solution of many, if not most, of the medical problems of industry will not be achieved, however, by the public agencies even with greatly augmented financial resources. The information required for the full appraisal of these problems and for their solution can come only from well-trained physicians and industrial hygienists who occupy responsible professional positions in industry. Only within the industrial organization can the special disciplines of occupational medicine and hygiene give effective guidance to industrial management toward the recognition and acceptance of its opportunities and responsibilities for the provision and maintenance of satisfactory conditions for the conduct of the day's work and for the safety and comfort of the community of which the industrial organization is a part. In our day, an industry is not well managed unless it is capably advised and supervised in medical matters. Such an industry will not proceed in ignorance or disregard of the facts to contaminate dangerously the food, the atmosphere, or the water supply of the community, nor will it wait until it is involved in the failure of other units of local industry to deal knowledgeably and intelligently with these matters. Under the guidance of a competent industrial physician the technical personnel of industry can solve these problems or, if necessary, can participate in an investigation that will provide a solution. It is shortsighted, often

dangerous, and usually unduly costly to follow the policy of *laissez faire* in such matters until legal compulsion is applied, for then the opportunities for unbiased discussion, impartial investigation, and satisfactory solution will often have vanished.

The scope of the professional services rendered to individuals by the practitioner of occupational medicine, or in a more restricted and more practical sense at this time, by the industrial physician, has been questioned in the past and will be questioned further and more searchingly in the future. Most of these questions have been answered in a general manner in such official pronouncements of organized medicine as that of the Council on Occupational Health, American Medical Association, in the constitution and bylaws of the American Academy of Occupational Medicine, and in the statements of purposes and policies of the American Board of Preventive Medicine.

From time to time these principles of professional behavior have been criticized as being expressions of the "division of labor" agreed upon within the profession for its own benefit or as further evidence of the fragmentation of medical practice whereby both patient and physician become so subdivided that the traditional and desirable doctor-patient relationship is lost. Other critics have held that the unit of medical care is the family and that industrial medical service should extend into the home and apply to the family as well as to the industrial employee. Many physicians and others in public health have seen medical practice in industry as an extension of public health practice into a new segment of community life and into a broadening field of more comprehensive medical care. In this attitude of mind they are aided and abetted, unintentionally for the most part, by the administrators of various programs for prepaid medical care, including those sponsored by industry for nonoccupational illness and disability.

It is not my intention to criticize or even to discuss the efforts to extend the benefits of good medical service to a larger proportion of our population under conditions that will spread the economic burden so that it can easily be borne by a prosperous society. All the statements in the preceding paragraph represent

misconceptions of the role of occupational medicine insofar as they include it in any general scheme for the provision of medical care. The essential feature of occupational medicine is not medical care but preventive medicine—preventive medicine in a grossly neglected field which requires for its reasonable success a highly specialized and concentrated attack upon the hazards and stresses of present-day life as these are displayed most prominently in the occupational environment of industry. To recognize these hazards, to seek them out, to understand them, to bring them under control at their sources, and to limit their uncontrolled dissemination beyond the confines of industry is to preserve ourselves against the increasing threats of a technological era which has revealed its destructive powers to those who have eyes with which to see. This is the special role of occupational medicine in our time.

There are other duties for the physician in industry to perform, and if he continues to be a good physician, he will perform these duties faithfully and well, but his primary responsibilities derive from his special knowledge, his special skill in the application of old and newly developed measures of preventive medicine for the protection of the industrial and the general population against the manmade perils of modern life. Medical care he must, in the nature of his primary work, leave to other physicians to whom he will refer those of his charges who seek or will accept his advice. Medical and surgical therapy, except in those situations in which his special knowledge is required, he delegates to other physicians and surgeons. He does not engage or compete with anyone in the field of medical care, for if he understands his work and adheres to it, there is no time for such activities.

It is conceivable that in some future time, when the current hygienic problems of industry shall have been solved and the physicians in industry shall have multiplied in number and skill to a point at which they can dispose of new problems with dispatch, they may extend their efforts into more common and less specialized fields of medical practice. For the present and for a long time to come there is little prospect for any trend in this direction. The physicians

in industry are too few, their work is too urgent, and their time is too limited to permit such wanderings from their main course. Their task is just begun, the trail has but been blazed, and much of the wilderness into which they venture is yet to be charted with accuracy. Therefore, all the more urgent is the recruitment of capable physicians into this field and their instruction and training in the fundamental characteristics and requirements of their life's work; not a bag of clinical, administrative, or technological tricks, but a sound approach to principles and general methods of inquiry, an understanding of the sources of information and advice, and the means of self-education in the midst of a changing scene.

What is required of the physician who enters the field of occupational medicine is, first, a point of view toward preventive medicine. But this is usually not sufficient. This point of view must be buttressed by training which will not dilute or detract from the knowledge and skill of the modern practicing physician but will provide him, in addition, with a reasonable competence in the disciplines of preventive, administrative, and legal medicine in industry and some grasp, which can be enlarged later, of the sociologic and economic history of mankind, particularly the institutional and organizational structure of his own society and the human relations that flow from this structure.

The special clinical knowledge of the industrial physician will lie in the field of industrial intoxications and physical stresses, and because of such knowledge he will be consulted by his colleagues in other fields of medical practice for diagnostic aid and for advice and guidance in the care of patients in the general population who have encountered the agents of such disease

in the home, on the farm, or elsewhere. For the products and instruments of industry are not confined within industry and are not always surrounded with adequate safeguards in their distribution and use. There is no substitute for experience in clinical medicine, and the time has not yet come when the practitioner of occupational medicine can free himself from such experience in his special field or in the more general field of human disease. Not only must he recognize and appraise the early signs of occupational disease, but he must also remember the potential effects of intercurrent illnesses, chronic degenerative diseases, and the aging processes upon human tolerance for industrial hazard and stress. If, then, the primary function of the industrial physician is to prevent occupational illness and disability and to cultivate and maintain the health of those who work, he will nevertheless depend upon his skill as a clinician and his breadth and depth of knowledge of medicine generally as the means to set the standards to be achieved by the methods of preventive medicine and industrial hygiene.

I do not mean to dissuade those now unprepared for industrial medical practice from entering upon it, for the need for more physicians in American industry is great, but let us not fail to visualize clearly the scope, the goals, and the responsibilities of occupational medicine, whether in industry or elsewhere in the places of employment of our people. Nor should we fail to recognize the need for a proper share of the best technical minds and the best trained minds in medicine, if a satisfactory solution of today's most serious problem of public health is to be achieved within a reasonable time.

Occupational Health Notes

Tests for Dishware Glazes

A standard method for testing the safety of glazes on dishes is being devised jointly by the U.S. Pottery Association, the Lead Industries Association, the Kettering Laboratories of the University of Cincinnati, and the National Bureau of Standards. The American Society for Testing Materials is developing a screening test for glazes that may be used at the plant or in health departments.

Action was taken to establish standards and tests after investigation of two cases of illness from lead absorption revealed the excessive lead content of dishware glaze used by a California company.

Lead Poisoning

A 4-year-old girl in South Dakota died from inhaling fumes from burning battery cases. Authorities learned that her father dismantled old cars to sell for junk and burned the battery cases in the kitchen stove. All 14 members of the family suffered from lead poisoning.

Lead fumes resulting from the use of blowtorches on surfaces covered with lead-based paints have been a serious hazard in old warships being dismantled in Washington State. Since much of the burning is done in confined areas, high concentrations of the fumes accumulate. One operation poisoned six workers.

Fire in Insecticide Warehouse

A fire in a California warehouse storing organic phosphate insecticides (parathion, TEPP, systox, and others) resulted in mild organic phosphate poisoning for about 10 persons, including several firemen.

City and county health department representatives and a State occupational health engineer supervised the cleaning up of the fire site. They set specifications regarding protective devices, medical supervision, and disposal of damaged materials. They specified that all waste materials be dumped in a

secluded portion of the public dumping grounds and covered with dirt, and that no material was to be dumped into a sewer or ditch.

The disposal and cleanup were carried out without ill effects to any worker; cholinesterase examinations did not reveal undue exposure to the insecticides.

Forestry Pilots Exposed to CO

While flying aerial tankers, U.S. Forestry Service pilots have been exposed to concentrations of carbon monoxide as high as 2½ times the Federal Aviation Agency's recommended limit of 50 ppm. The tankers are used to spray chemicals on forest fires.

Collapsible Air Tent

A routine inspection of an air tent by a local fire marshal in Michigan led to an investigation that found an unusual hazard to public health. The tent is used by a church group and holds 500 to 700 persons. It was supported only by air pressure from a centrifugal fan. In a simulated power failure, the tent remained above head height for 35 minutes with doors closed, but collapsed within 35 seconds when the doors were open.

Solid supports for the tent were considered necessary in case of power failure. In addition, a gas-driven auxiliary power supply was installed.

Dry Cleaning

In a survey of 81 dry cleaning plants in Cincinnati, only 7 were considered to be in any way hazardous. Almost no carbon tetrachloride was used. Most plants used perchloroethylene; a few used Stoddard's solvent.

In Oklahoma, the first of several surveys to evaluate the hazards of perchloroethylene in coin-operated dry cleaning shops indicated the need for specific regulations for such establishments. Special attention is being paid in the surveys to possible hazards in machine failure to extract solvent from clothing, during machine repairs, in the disposal of solvent-soaked muck, as well as to ventilation and to provisions for accidental spilling of solvent.

State Government Offices

Pennsylvania's division of occupational health, after a complete inspection of State office buildings, found that operations and hazards common in industrial settings were duplicated in the government offices.